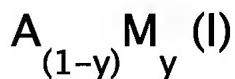


## Claims

[c1] 1. A write once recording medium (WORM) comprising:  
a substrate;  
a first protective layer on the substrate;  
an inorganic recording layer on the first protective layer,  
wherein the inorganic recording layer, upon heating via  
irradiation of a laser beam, is induced to undergo a local  
reaction and heat absorption to form a recorded mark  
with distinctive reflectivity, and the inorganic recording  
layer is made of materials comprising those as shown in  
formula I:



wherein A is comprised of silicon (Si) or tin (Sn); M is se-  
lected from the group consisting of aluminum (Al), silver  
(Ag), Gold (Au), Znic (Zn), titanium (Ti), nickel (Ni), cop-  
per (Cu), cobalt (Co), tantalum (Ta), iron (Fe), tungsten  
(W), chromium (Cr), vanadium (V), gallium (Ga), lead (Pb),  
molybdenum (Mo), indium (In), and tellurium (Te); y is in  
the range of 0.02 ~ 0.8;

a second protective layer on the inorganic recording  
layer; and

a reflective layer on the second protective layer.

- [c2] 2.The WORM of claim 1, wherein the thickness of the in-organic recording layer is in the range of 3 nm ~ 80 nm.
- [c3] 3.The WORM of claim 1, wherein the first protective layer and the second protective are made of a material se-lected from the group consisting of silicon nitride ( $\text{SiN}_x$ ), zinc sulfide-sulfur dioxide ( $\text{ZnS}-\text{SiO}_2$ ), aluminum nitride ( $\text{AlN}_x$ ), silicon carbide ( $\text{SiC}$ ), germanium nitride ( $\text{GeN}_x$ ), titanium nitride ( $\text{TiN}_x$ ),tantalum oxide ( $\text{TaO}_x$ ), and yttriu-moxide ( $\text{YO}_x$ ).
- [c4] 4.The WORM of claim 1, wherein a thickness of the first protective layer and the second protective layer is in the range of 1 nm ~ 200 nm.
- [c5] 5.The WORM of claim 1, wherein the first protective layer and the second protective layer comprise a single dielec-tric layer or a complex dielectric layer.
- [c6] 6.The WORM of claim 1, wherein the reflective layer is made of a material selected from the group consisting of Au, Ag, Al, Ti, Pb, Cr, Mo, W, Ta, and an alloy of the fore-going metals.
- [c7] 7.The WORM of claim 1, wherein a thickness of the re-flective layer is in the range of 10 nm ~ 200 nm.
- [c8] 8.The WORM of claim 1, further comprising a protective

resin layer on the reflective layer.

- [c9] 9.The WORM of claim 1, wherein the protective resin layer comprises a photosetting resin.
  - [c10] 10.The WORM of claim 1, wherein the inorganic recording layer comprises an alloy layer formed via a method of co-sputtering deposition, apple pie target sputtering deposition or alloy target sputtering deposition.
  - [c11] 11.The WORM of claim 1, wherein the substrate comprises a substrate of CD-R, DVD-R, blue laserR, and blue laser WORM.
  - [c12] 12.A WORM comprising:
    - a substrate; and
    - an inorganic recording layer on the substrate, wherein the inorganic recording layer, upon heating via irradiation of a laser beam, is induced to undergo a local reaction and heat absorption to form a recorded mark with distinctive reflectivity, and the inorganic recording layer is made of materials comprising those as shown in formula I:
- $A_{(1-y)} M_y$  (I)
- wherein A is comprised of silicon (Si) or tin (Sn); M is selected from the group consisting of aluminum (Al), silver (Ag), Gold (Au), Znic (Zn), titanium (Ti), nickel (Ni), cop-

per (Cu), cobalt (Co), tantalum (Ta), iron (Fe), tungsten (W), chromium (Cr), vanadium (V), gallium (Ga), lead (Pb), molybdenum (Mo), indium (In), and tellurium (Te); y is in the range of 0.02 ~ 0.8.

- [c13] 13. The WORM of claim 12, further comprising a first protective layer on the inorganic recording layer.
- [c14] 14. The WORM of claim 13, wherein the first protective layer is made of a material selected from the group consisting of silicon nitride ( $\text{SiN}_x$ ), zinc sulfide-sulfur dioxide ( $\text{ZnS-SiO}_2$ ), aluminum nitride ( $\text{AlN}_x$ ), silicon carbide ( $\text{SiC}$ ), germanium nitride ( $\text{GeN}_x$ ), titanium nitride ( $\text{TiN}_x$ ), tantalum oxide ( $\text{TaO}_x$ ), and yttrium oxide ( $\text{YO}_x$ ).
- [c15] 15. The WORM of claim 13, further comprising a reflective layer on the first protective layer.
- [c16] 16. The WORM of claim 13, further comprising:
  - a first protective layer between the inorganic recording layer and the substrate; and
  - a second protective layer on the inorganic recording layer.
- [c17] 17. The WORM of claim 16, wherein the first protective layer and the second protective are made of a material selected from the group consisting of silicon nitride ( $\text{SiN}_x$ ), zinc sulfide-sulfur dioxide ( $\text{ZnS-SiO}_2$ ), aluminum ni-

tride ( $\text{AlN}_x$ ), silicon carbide ( $\text{SiC}$ ), germanium nitride ( $\text{GeN}_x$ ), titanium nitride ( $\text{TiN}_x$ ), tantalum oxide ( $\text{TaO}_x$ ), and yt-triumoxide ( $\text{YO}_x$ ).